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THE INFLUENCE OF THE ENVIRONMENTAL FACTORS ON THE YIELDS OF SOME FODDER CROPS CULTIVATED IN THE PEDO-CLIMATIC CONDITIONS OF A.R.D.S. SIMNIC – CRAIOVA

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Key words: Sudan grass, seed millet, orchard grass, soil, climate

ABSTRACT

In the paper, there are presented the yields of the Sudan grass, millet for seeds and orchard grass, in the pedo-climatic conditions from the A.R.D.S. Simnic – Craiova (2007 – 2010).

At the Sudan grass, the highest yields were registered at Sorin variety – 21,24 t/ha.

At the orchard grass, from the the two experimented varieties, Adrian variety registered the highest yields for the whole research period.

At the seed millet, from the five studied varieties, Minerva registered the highest average value for the 4 years of study – 2.535 kg/ha. High yields were registered at Marius and Marte varieties – 2.472 kg/ha and respectively 2.429 kg/ha.

INTRODUCTION

The rapid extend into production of a big and various number of perennial grasses varieties, is imposing the development of new technological solutions in order to permit the establishment of an optimum energo-proteic ratio for the animal feeding, offering multiple possibilities at the disposal of the actual agricultural system, private or state, aiming the recovery of the Romanian agricultural production.

Previous research on fodder crops mixtures undertaken in the soil and climate conditions of the central area of Oltenia, did not sufficiently elucidate the knowledge of all the technological factors.

In the case of the increase of the animal livestock and of the decrease of the forage crops areas, a new strategy is necessary in order to obtain higher yields with the same costs per unit area.

To accomplish these tasks, in the experimental field of the Research and Development Station Şimnic - Craiova, there were established multiple trials to study the perennial grasses fodder crops and mixtures (C. Bora & C.V. Popescu, 2009).

Sudan grass, millet for seeds and orchard grass are important crops, presenting a good yield potential.

The climatic data analysis over the last 40 years of the XX-th century for Romania are evidencing a decrease of the annual rainfall quantities, especially in the southern and south-eastern areas of the country, areas affected in addition by an increase of the temperature.

MATERIAL AND METHODS

The trials were established on reddish preluvosoil, pseudo-gleic in depth, with a reduced humic content (only in the first 25 cm the humic content is 2%) and a clay content equal with 39, 6% (C. Bora & C.V. Popescu, 2009).

The soil is medium supplied with phosphorus and potassium, with a moderate calcium and natrium content, without being endangered by alcalinisation or salinisation (C.V. Popescu & C. Bora 2009).

Regarding the experimental design – the establishment of the trial, the under divided plots method with a surface per plot of 20 m^2, in four repetitions was used.

The first mowing took place at the ear stage of the orchard grass and the last one around the temperature of 0 ^oC (the interval was 35-40 days).

At the establishment of the trials were applied 5 t/ha of $CaCO_3$ amendments in order to ameliorate the acid pH of the soil.

The area's climatic characteristics (meteorological data registered in the last 68 years) are the following: the annual average temperature - 10, 8 ^oC; the sum of the annual rainfall - 539,4 mm; the relative humidity of the air - 71%; the nebulosity - 5,3; the duration of the sun shining (hours and tenths) – 2.121,5; the number of days with frost - 112,2; the number of the tropical days - 48,3 (C.V. Popescu & C. Bora, 2009; C. Bora & C.V. Popescu, 2009).

Regarding the temperatures and rainfalls registered in the research period, the differences related to the multiannual average are positive in the case of the temperatures and negative in the case of the rainfalls.

The trend of aridisation of the area can be easily observed and so the necessity to supply artificially the moisture deficit as a main method to reduce or eliminate the drought impact over the yields.

The yields of 2 Sudan grass, 5 seed millet and 2 orchard grass were determined in natural conditions (2007 – 2010).

RESULTS AND DISCUSSIONS

From the table below (Table 1), it can be observed the fact that the highest yield results for the Sudan grass were registered at Sorin variety - 21,24 t/ha (G.M. - green mass and D.M. - dry matter).

Sabin variety registered lower average yields – 19, 70 t/ha G.M and 4, 96 t/ha D.M.

Table 1

Sudan Grass yields

Nr.	Variety/Year	Yields; t/ha					
		2007		2008		Average	
		G.M.	D.M.	G.M.	D.M.	G.M.	D.M.
1	Sorin	21,02	5,29	21,45	5,52	21,24	5,41
2	Sabin	19,32	4,75	20,08	5,17	19,70	4,96

Regarding the yields of the millet cultivated for seeds, the values from the five studied varieties were, in average for the four experimental years, higher at the Minerva variety - 2.535 kg/ha.

High yields were registered at Marius and Marte varieties – 2.472 kg/ha and respectively 2.429 kg/ha (Table 2).

The other cultivars, registered lower average yields: Marte - 2,429 t/ha, Marius - 2,472 t/ha, Mirel - 2,215 t/ha and Margarit - 2,122 t/ha.

Table 2

Millet – seed yields

Nr.	Variety/Year	Yields; t/ha		
		2007	2008	Average
1	Minerva	2215	2854	2535
2	Marte	2163	2695	2429
3	Mirel	1983	2447	2215
4	Marius	2189	2755	2472
5	Mărgărit	1869	2376	2122

At the orchard grass, from the the two experimented varieties, Adrian variety registered the highest yields for the whole research period (Table 3).

Ovidiu variety registered lower average yields – 17,85 t/ha G.M and 4,70 t/ha D.M.

Table 3

Orchard grass yields

Nr.	Variety/ Year	Yields; t/ha									
		2007		2008		2009		2010		Average	
		G.M.	D.M	G.M.	D.M	G.M.	D.M	G.M.	D.M	G.M.	D.M
1	Ovidiu	15,69	4,57	15,76	4,16	16,57	4,21	18,08	4,48	16,53	4,36
2	Adrian	16,96	4,93	17,05	4,50	17,94	4,56	19,45	4,81	17,85	4,70

CONCLUSIONS

The highest yield results for the Sudan grass were registered at Sorin variety - 21,24 t/ha (G.M. - green mass and D.M. - dry matter). Sabin variety registered lower average yields – 19,70 t/ha G.M and 4,96 t/ha D.M.

Regarding the yields of the millet cultivated for seeds, the values from the five studied varieties were, in average for the four experimental years, higher at the Minerva variety - 2.535 kg/ha. High yields were registered at Marius and Marte varieties – 2.472 kg/ha and respectively 2.429 kg/ha.

At the orchard grass, from the the two experimented varieties, Adrian variety registered the highest yields for the whole research period.

Ovidiu variety registered lower average yields – 17,85 t/ha G.M and 4,70 t/ha D.M.

In the studied area’s conditions, good yields are to be obtained only using irrigation.

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